

In the Claims

Please cancel claims 10-18 without prejudice.

1. (previously amended) A coating composition for forming a transparent, abrasion-resistant coating upon a substrate, comprising:

- a) the hydrolysis product of an epoxy-functional alkoxy silane,
- b) a curing agent for polymerizing epoxy compounds, the curing agent comprising a cationic photoinitiator,
- c) an ethylenically unsaturated monomer and photoactivated free-radical initiator therefore, and
- d) a viscosity-reducing amount up to 50 % by weight, solids basis, of an unhydrolyzed epoxy-functional alkoxy silane,

wherein the silanes of parts a) and d) are separately prepared and blended to form the composition and the composition is photocurable.

2. (original) The coating composition of claim 1 wherein said ethylenically unsaturated monomer comprises an acrylic monomer.

3. (original) The coating composition of claim 2 wherein said acrylic monomer has an acrylic functionality not greater than two.

4. (original) The coating composition of claim 1 including an essentially non-reactive polyether surfactant in sufficient quantity to improve tintability of a cured coating formed from said composition.

5. (original) The coating composition of claim 4 wherein said polyether surfactant is a siloxane.

6. (original) The coating composition of claim 4 wherein said polyether surfactant is a polyalkyleneoxide siloxane.

7. (original) The coating composition of claim 4 wherein said polyether surfactant is an alkoxy polyethylene oxyalkanol.

8. (original) The coating composition of any one of claims 4 - 6 in which the surfactant is at least partially water soluble.

9. (original) The coating composition of any one of claims 4 - 6 in which the surfactant is insoluble in water.

Claims 10 - 18 (Cancelled)

19. (previously added) The coating composition of claim 1 wherein the epoxyfunctional alkoxy silanes of parts a) and d) are independently prepared from the group consisting of glycidoxymethyl-trimethoxysilane, glycidoxymethyltriethoxysilane, glycidoxymethyl-tripropoxysilane, glycidoxymethyl-tributoxysilane,  $\beta$  - glycidoxyethyltrimethoxysilane,  $\beta$  -glycidoxyethyltriethoxysilane,  $\beta$  -glycidoxyethyl-tripropoxysilane,  $\beta$  -glycidoxyethyl-tributoxysilane,  $\beta$  -glycidoxyethyltrimethoxysilane,  $\alpha$  - glycidoxyethyl-triethoxysilane,  $\alpha$  -glycidoxyethyl-tripropoxysilane,  $\alpha$  - glycidoxyethyltributoxysilane,  $\gamma$  -glycidoxypropyl-trimethoxysilane,  $\gamma$  -glycidoxypropyl-triethoxysilane,  $\gamma$  -glycidoxypropyl-tripropoxysilane,  $\gamma$  -glycidoxypropyltributoxysilane,  $\beta$  - glycidoxypropyl-trimethoxysilane,  $\beta$  -glycidoxypropyl-triethoxysilane,  $\beta$  -glycidoxypropyl-tripropoxysilane,  $\beta$  -glycidoxypropyltributoxysilane,  $\alpha$  -glycidoxypropyl-trimethoxysilane,  $\alpha$  - glycidoxypropyl-triethoxysilane,  $\alpha$  -glycidoxypropyl-tripropoxysilane,  $\alpha$  - glycidoxypropyltributoxysilane,  $\gamma$  -glycidoxybutyl-trimethoxysilane,  $\delta$  -glycidoxybutyl-triethoxysilane,  $\delta$  -glycidoxybutyl-tripropoxysilane,  $\delta$  -glycidoxybutyl-tributoxysilane,  $\delta$  - glycidoxybutyl-trimethoxysilane,  $\gamma$  -glycidoxybutyl-triethoxysilane,  $\gamma$  -glycidoxybutyl-

tripropoxysilane,  $\gamma$ -propoxybutyl-tributoxysilane,  $\delta$ -glycidoxybutyl-trimethoxysilane,  $\delta$ -glycidoxybutyl-triethoxysilane,  $\delta$ -glycidoxybutyl-tripropoxysilane,  $\alpha$ -glycidoxybutyl-trimethoxysilane,  $\alpha$ -glycidoxybutyl-triethoxysilane,  $\alpha$ -glycidoxybutyl-tripropoxysilane,  $\alpha$ -glycidoxybutyl-tributoxysilane, (3,4-epoxycyclohexyl)-methyl-trimethoxysilane, (3,4-epoxycyclohexyl)methyl-triethoxysilane, (3,4-epoxycyclohexyl)methyl-tripropoxysilane, (3,4-epoxycyclohexyl)-methyl-tributoxysilane, (3,4-epoxycyclohexyl)ethyl-trimethoxysilane, (3,4-epoxycyclohexyl)ethyl-triethoxysilane, (3,4-epoxycyclohexyl)ethyl-tripropoxysilane, (3,4-epoxycyclohexyl)-ethyl-tributoxysilane, (3,4-epoxycyclohexyl)propyl-trimethoxysilane, (3,4-epoxycyclohexyl)propyl-triethoxysilane, (3,4-epoxycyclohexyl)propyl-tripropoxysilane, (3,4-epoxycyclohexyl)propyl-tributoxysilane, (3,4-epoxycyclohexyl)butyl-trimethoxysilane, (3,4-epoxycyclohexyl)butyl-triethoxysilane, (3,4-epoxycyclohexyl)-butyl-tripropoxysilane, and (3,4-epoxycyclohexyl)butyl-tributoxysilane.

11 20. (previously added) The coating composition of claim 1 wherein the silane of part a) is added in an amount sufficient to provide a concentration in the composition, based on weight (solids basis), of between about 10% to about 75%, and the silane of part d) is added in an amount sufficient to provide a concentration of not less than about 10%.

12 21. (previously added) The coating composition of claim 1 wherein the ethylenically unsaturated monomers comprise acrylic monomers and oligomers having acrylic functionalities of not greater than two.

13 22. (previously added) The coating composition of claim 21 wherein the monomers are selected from the group consisting of ethyl acrylate, butyl acrylate, 2-hydroxypropyl acrylate, cyclohexyl acrylate, 2-ethylhexyl acrylate, methyl methacrylate, ethyl methacrylate, neopentylglycol diacrylate, pentaerythritol triacrylate, 1,6-hexanediol diacrylate, trimethylolpropane triacrylate, tetraethylene glycol diacrylate, 1,3-butylene glycol diacrylate,

trimethylolpropane trimethacrylate, 1,3-butylene glycol dimethacrylate, ethylene glycol dimethacrylate, pentaerythritol tetraacrylate, tetraethylene glycol dimethacrylate, 1,6-hexanediol dimethacrylate, ethylene glycol diacrylate, diethylene glycol diacrylate, glycerol diacrylate, glycerol triacrylate, 1,3-propanediol diacrylate, 1,3-propanediol dimethacrylate, 1,2,4-butanetriol trimethacrylate, 1,4-cyclohexanediol diacrylate, 1,4-cyclohexanediol dimethacrylate, pentaerythritol diacrylate, and 1,5-pentanediol dimethacrylate.

14 23. (previously added) The coating composition of claim 22 wherein the monomers are employed at a weight concentration in the composition from about 10% to about 25%, on a solids basis.

15 24. (previously added) The coating composition of claim 1 wherein the cationic photoinitiator is selected from the group consisting of salts of Group Va elements, salts of Group VIa elements, and salts of Group VIIa elements.

16 25. (previously added) The coating composition according to claim 24 wherein the cationic photoinitiator comprises a diaryl iodonium hexafluoroantimonate.

17 26. (previously added) The coating composition according to claim 1 wherein the photoactivated free-radical initiator is selected from the group consisting of haloalkylated aromatic ketones, chloromethylbenzophenones, benzoin ethers, and acetophenone derivatives.

18 27. (previously added) The coating composition according to claim 26 wherein the initiator is selected from the group consisting of diethoxyacetophenone, 2-hydroxy-2-methyl-1-phenylpropan-1-one, benzil ketals,  $\alpha,\alpha$ -dimethoxy- $\alpha$ -phenyl acetophenone, 2-hydroxy-2-methyl-1-phenylpropane-1-one, ethyl benzoin ether, isopropyl benzoin ether, dimethoxyphenyl acetophenone, diethoxy acetophenone, and benzophenone.

19 28. (previously added) The coating composition according to claim 1 wherein the composition is substantially free of volatile solvents.

29. (previously added) The coating composition according to claim 1 wherein the composition can be cured using ultraviolet radiation.

30. (previously added) The coating composition of claim 1 wherein the epoxyfunctional alkoxy silanes of parts a) and d) are independently prepared from the group consisting of glycidoxymethyl-trimethoxysilane, glycidoxymethyltriethoxysilane, glycidoxymethyl-tripropoxysilane, glycidoxymethyl-tributoxysilane,  $\beta$ -glycidoxyethyltrimethoxysilane,  $\beta$ -glycidoxyethyltriethoxysilane,  $\beta$ -glycidoxyethyltripropoxysilane,  $\beta$ -glycidoxyethyltributoxysilane,  $\alpha$ -glycidoxyethyl-triethoxysilane,  $\alpha$ -glycidoxyethyl-tripropoxysilane,  $\alpha$ -glycidoxyethyltributoxysilane,  $\gamma$ -glycidoxypropyl-trimethoxysilane,  $\gamma$ -glycidoxypropyltriethoxysilane,  $\gamma$ -glycidoxypropyl-tripropoxysilane,  $\gamma$ -glycidoxypropyltributoxysilane,  $\beta$ -glycidoxypropyl-trimethoxysilane,  $\beta$ -glycidoxypropyl-triethoxysilane,  $\beta$ -glycidoxypropyltripropoxysilane,  $\beta$ -glycidoxypropyltributoxysilane,  $\alpha$ -glycidoxypropyl-trimethoxysilane,  $\alpha$ -glycidoxypropyl-triethoxysilane,  $\alpha$ -glycidoxypropyl-tripropoxysilane,  $\alpha$ -glycidoxypropyltributoxysilane,  $\gamma$ -glycidoxybutyl-trimethoxysilane,  $\delta$ -glycidoxybutyltriethoxysilane,  $\delta$ -glycidoxybutyl-tripropoxysilane,  $\delta$ -glycidoxybutyl-tributoxysilane,  $\delta$ -glycidoxybutyl-trimethoxysilane,  $\gamma$ -glycidoxybutyl-triethoxysilane,  $\gamma$ -glycidoxybutyltripropoxysilane,  $\gamma$ -propoxybutyl-tributoxysilane,  $\delta$ -glycidoxybutyl-trimethoxysilane,  $\delta$ -glycidoxybutyl-triethoxysilane,  $\delta$ -glycidoxybutyl-tripropoxysilane,  $\alpha$ -glycidoxybutyl-trimethoxysilane,  $\alpha$ -glycidoxybutyl-triethoxysilane,  $\alpha$ -glycidoxybutyl-tripropoxysilane,  $\alpha$ -glycidoxybutyl-tributoxysilane, (3,4-epoxycyclohexyl)-methyl-trimethoxysilane, (3,4-epoxycyclohexyl)methyl-triethoxysilane, (3,4-epoxycyclohexyl)methyl-tripropoxysilane, (3,4-epoxycyclohexyl)-methyl-tributoxysilane, (3,4-epoxycyclohexyl)ethyl-trimethoxysilane, (3,4-epoxycyclohexyl)ethyl-triethoxysilane, (3,4-epoxycyclohexyl)ethyl-tripropoxysilane, (3,4-

epoxycyclohexyl)-ethyl-tributoxysilane, (3,4-epoxycyclohexyl)propyl-trimethoxysilane, (3,4-epoxycyclohexyl)propyl-triethoxysilane, (3,4-epoxycyclohexyl)propyl-tripropoxysilane, (3,4-epoxycyclohexyl)propyl-tributoxysilane, (3,4-epoxycyclohexyl)butyl-trimethoxysilane, (3,4-epoxycyclohexyl)butyl-triethoxysilane, (3,4-epoxycyclohexyl)butyl-tripropoxysilane, and (3,4-epoxycyclohexyl)butyl-tributoxysilane,

and wherein the ethylenically unsaturated monomers are selected from the group consisting of ethyl acrylate, butyl acrylate, 2-hydroxypropyl acrylate, cyclohexyl acrylate, 2-ethylhexyl acrylate, methyl methacrylate, ethyl methacrylate, neopentylglycol diacrylate, pentaerythritol triacrylate, 1,6-hexanediol diacrylate, trimethylolpropane triacrylate, tetraethylene glycol diacrylate, 1,3-butylene glycol diacrylate, trimethylolpropane trimethacrylate, 1,3-butylene glycol dimethacrylate, ethylene glycol dimethacrylate, pentaerythritol tetraacrylate, tetraethylene glycol dimethacrylate, 1,6-hexanediol dimethacrylate, ethylene glycol diacrylate, diethylene glycol diacrylate, glycerol diacrylate, glycerol triacrylate, 1,3-propanediol diacrylate, 1,3-propanediol dimethacrylate, 1,2,4-butanetriol trimethacrylate, 1,4-cyclohexanediol diacrylate, 1,4-cyclohexanediol dimethacrylate, pentaerythritol diacrylate, and 1,5-pentanediol dimethacrylate,

and wherein the cationic photoinitiator is selected from the group consisting of salts of Group Va elements, salts of Group VIa elements, and salts of Group VIIa elements,

and wherein the photoactivated free-radical initiator is selected from the group consisting of diethoxyacetophenone, 2-hydroxy-2-methyl-1-phenylpropan-1-one, benzil ketals,  $\alpha,\alpha$ -dimethoxy- $\alpha$ -phenyl acetophenone, 2-hydroxy-2-methyl-1-phenylpropane-1-one, ethyl benzoin ether, isopropyl benzoin ether, dimethoxyphenyl acetophenone, diethoxy acetophenone, and benzophenone,

and wherein the composition is substantially free of volatile solvents and can be cured using ultraviolet radiation.